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DIRECTORATE FOR EDUCATION AND SKILLS
EDUCATION POLICY COMMITTEE

Future of Education and Skills 2030: Conceptual Learning Framework

Draft Concept note on developmental foundations and compound competencies

8th Informal Working Group (IWG) Meeting
29-31 October 2018
OECD Conference Centre, Paris, France

This draft include two concept notes:

- The draft concept note on Developmental Foundations
- The draft concept note on Complex/Compound Competencies

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This is still a **"working document"** to be discussed and refined during the during the 8th IWG meeting on 29 October 2018.

For ACTION: Participants are invited to DISCUSS the draft (e.g. key messages, concepts, definitions, narratives, suggest further references) during the Item 3.d "World Café" and COMMENT on the draft by 5 November 2018 in case participants are not able to attend the meeting.

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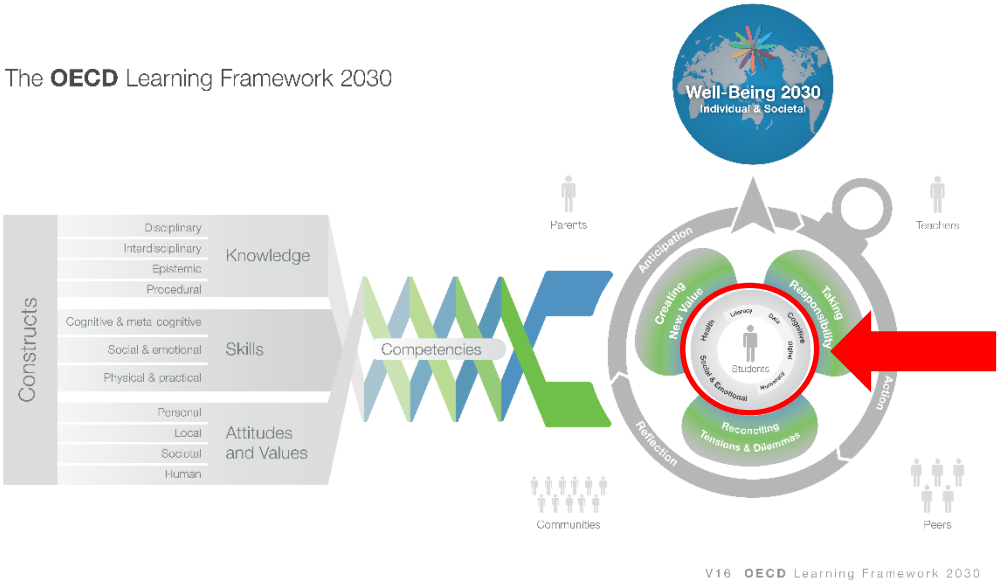
This draft includes two concept notes:

Developmental foundations

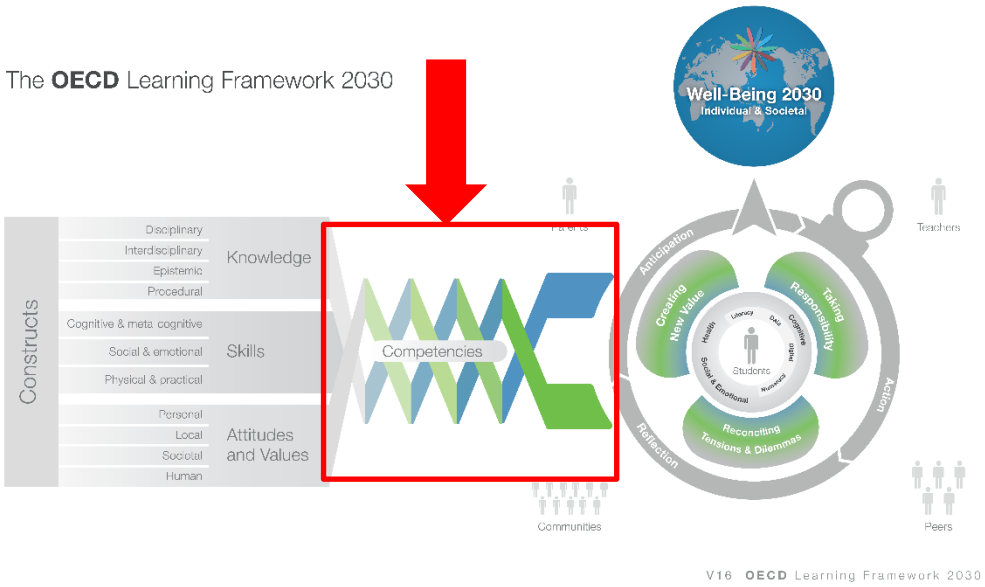
Figure 1.1. Developmental foundations



Source: Education and Skills 2030 Learning Framework

Complex/ Compound Competencies

Figure 1.2. Complex/ compound competencies



Source: Education and Skills 2030 Learning Framework

1. Developmental foundations for 2030

Definitions and scope

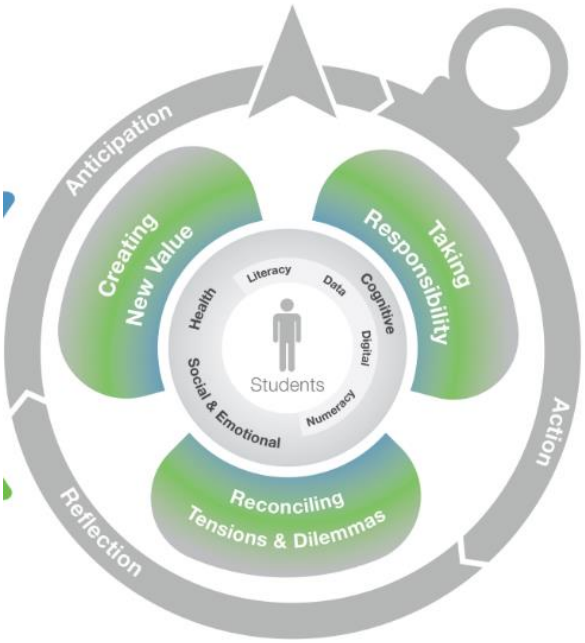
The OECD 2030 Learning Framework defines "developmental foundations" as "the fundamental conditions and certain core skills, which are pre-conditions and a gateway to further learning across the whole curriculum". All students will need this solid grounding to fulfil their potential to become responsible contributors to and healthy members of society in 2030 and beyond. The scope of the foundations includes:

- Cognitive foundations
- Social and emotional foundations
- Physical and mental health foundations

The framework further articulates core foundation skills relating to cognitive foundations:

- Literacy: will give a definition
- Numeracy: will give a definition
- Digital literacy: to be elaborated - 'the ability to search for, select, critically evaluate and use information for solving problems in various contexts' (Limberg, Sundin and Talja, 2012[1]).
- Data literacy: to be elaborated - the ability to derive meaningful information from data, the ability to read, work with, analyse and argue with data, and "understanding what data mean, including how to read charts appropriately, draw correct conclusions from data and recognize when data are being used in misleading or inappropriate ways" (Carlson et al., 2011[2]).

Figure 1.1. The OECD 2030 Learning Framework: relationship between foundations, student agency and transformative competencies



Box 1.1. Key messages on developmental foundations

- Literacy and numeracy will remain fundamental skills, which are prerequisites for developing student agency and upon which more complex competencies can be built
- However, what it means to be literate and numerate in 2030 will look different from today due to newly emerging means of daily communication
- Digital literacy and data literacy are vital extensions of literacy and numeracy in 2030 and beyond
  - Digital literacy is fundamental to social, personal, and professional engagement and success in 2030 and beyond.
  - Data literacy should become part of core foundations all students are equipped with as various types of data are being produced at a rate of exponential growth.
- Core foundations are not just about cognitive development. Our basic need for good physical health must be satisfied.
- Social, emotional, moral and ethical foundations also need to be acknowledged as basic
  - Social and emotional foundations will help students to lay a solid grounding to build their success in academic, economic and social life.
  - Moral and ethical foundations (to be added)
- Without a solid grounding in these core skills and foundations, disadvantaged children are at risk of being even further disadvantaged

Literacy and numeracy will remain fundamental skills, which are prerequisites for developing student agency and upon which more complex competencies can be built

Traditionally, the two foremost developmental foundations have been literacy and numeracy. These skills are fundamental to students' ability not only to progress with their learning at school, but to succeed in life after school as active, engaged and responsible adults. In essence, both literacy and numeracy are the foundation of communication. Therefore they are explicitly articulated as the foundations of the OECD 2030 Learning Framework, suggesting that students need to have these solid foundations before developing agency, creating new value, reconciling tensions and dilemmas, or taking responsibility (see draft Education 2030 concept note on transformational competencies).

Note to the reader – this section will be elaborated to illustrate how literacy and numeracy relates to the development of "student agency" and "transformative competencies".

However, what it means to be literate and numerate in 2030 will look different from today due to newly emerging means of daily communication

What literacy and numeracy means for students today will look different in the future from traditional, narrow conceptualisations of printed, material texts or rote learning.

With the increased connectivity and the growing use of data, we are increasingly immersed in digital text, with visualisation of data, with online news and content, e-books, blogs, smart phone text interfaces, social media and so forth undeniably the norm for day-to-day reading and communication.

Embedded within these digital texts and data, online sources are vast amounts of information. Personalised health and fitness apps on our personal mobile phones that collect real-time data from our location services and physical movement, finance and budgeting apps that gather data from our banking transactions or online accounts, interactive graphs and charts in the social media or online news sources, video (or 'vlogs'), social media sites and apps, 'smart' home appliances that are networked with our phones—all these and more have irrevocably changed the nature and density of our interaction with the digital world.

Digital literacy and data literacy are vital extensions of literacy and numeracy in 2030 and beyond

The OECD 2030 Learning Framework therefore extends the scope of literacy and numeracy to encompass digital literacy and data literacy, which are undeniably fundamental to our ability to function effectively and thrive as individuals and citizens in the world today and will increasingly be so, with the relentless expansion of both the scope and application of such technologies and with increasing use of visualised data in our everyday lives.

Being literate will require the ability to read, interpret, make meaning of and communicate through not just printed text but digital texts and sources from a variety of online and digital media. Being numerate will require not just being able to work through mathematical formula in an exercise book, but rather being proficient in navigating, interpreting and computing diverse types of data and numerical information in our everyday lives and professional contexts.

Digital literacy is ***fundamental to social, personal, and professional engagement and success in 2030 and beyond.***

The digital age poses new communication opportunities and challenges. As the means of communicating written information become more diversified, students need to be able to locate, evaluate, and interpret diverse digital and printed material (Rouet and Britt, 2012[3]).

'Digital literacy' can be considered cognitively similar to traditional forms of literacy: it is most accessible to people who have already mastered 'traditional' literacy skills, and so is considered an extension of core literacies in the Education 2030 Learning Framework.

There are of course key differences between printed and digital text.

Unlike traditional printed texts, digital text is not linear, it is rich in hyperlinks that bring the reader from one part to another, and allow to easily leave the original text and go explore further and further; digital texts may contain video footage or audio content; digital texts may even include augmented reality content. To navigate amongst hyperlinks for example, one has to sieve piles of excessive information. This requires more cognitive abilities from readers which makes it more difficult and therefore relates to a difference in the performance on printed and digital tasks (Naumann, 2015[4]) (Rouet, Vörös and Pléh, 2012[5]).

Digital literacy implies the possession and application of information and communication technology (ICT) skills. ICT is technology which provides for the electronic input, storage, retrieval, processing, transmission and dissemination of information (E2030 Glossary). ICT skills for 2030 include:

- Basic ICT skills or 'ICT literacy': i.e. the ability to use ICT for basic tasks and as a tool for learning;
- Applied ICT skills: i.e. the ability to use simple ICT tools in general workplace settings (in non-IT jobs);
- Professional ICT skills: i.e. the ability to use advanced ICT tools, and/or to develop, repair and create such tools.

Digital literacy is not limited to skills. It includes also includes the development of the right attitudes and values to use information in the digital space in a responsible way.

(Note to the reader - To be elaborated to illustrate concrete examples of the key message given in the title, and include the cooperation between the OECD 2030 Learning Framework and the Digital Intelligence Framework.)

Data literacy should become part of core foundations all students are equipped with as various types of data are being produced at a rate of exponential growth.

Data is getting bigger and bigger and with it, so does the importance of data literacy. In 2017, people generated more data than all of mankind had from the beginning of recorded history to 2010 (Weigend, 2013). Every minute YouTube users upload over forty-eight hours of new video, Twitter reports that nearly 175 million tweets are posted every day and roughly thirty billion pieces of content are shared on Facebook every month. Data is being produced at an unprecedented rate and this growth is not only in size but also source. Sequencing the first human genome took researchers a decade and cost billions of dollars, now it can be accomplished in a week for less than one-millionth of the price (Mulcahy, 2017).

A stronger focus on data literacy in primary and secondary education will have the following effect:

- Data literacy increases and distributes the economic impact of data. Big data is one of the fastest growing economies in the world and is estimated to be a fifty-billion-dollar business in 2017. Employees with data science experience have become highly valued and it is estimated that in the U.S. alone there is nearly a 200,000-person deficit of people with analytical skills (Mulcahy, 2017).
- Data literacy facilitates local populations solving local problems. Big data is not exclusively global data. Increasingly, more municipalities are using the predictive power of data to cut costs, evaluate the effectiveness of programs and even fight crime (Oceans of Data Institute, 2016).
- Data literacy enables citizens to keep governments accountable and transparent. Many governments provide open access to a vast array of data from demographics to finance. These datasets have been used to track civil rights violations, detect corruption and generate citizen engagement (Small, 2015).
- Data literacy expands the inclusivity and diversity around data. The digital divide is a term used to describe the "differential access and ability to use information

and communications technologies between individuals, communities and countries - and the resulting socioeconomic and political inequalities" (D'Ignazio and Bhargava, 2015[6]) Data literacy establishes a bridge across this growing divide.

The current explosive growth of big data industries and influence is only indicative of what is happening towards 2030. Data literacy programs will be essential to preparing the next generation of students for the future economic and social changes. Data literacy is increasingly essential to navigating our digital world and thus is included as a foundational skill in the OECD 2030 Learning Framework.

Note to the reader: this section will be revisited, refined and elaborated.

Core foundations are not just about cognitive development. Our basic need for good physical health must be satisfied.

Alongside the four cognitive foundations (literacy, numeracy, digital and data literacy), health is therefore included as a core condition in the Education 2030 Learning Framework. For students to learn effectively at school, they need to be in good overall health and well-being. Physical health issues, either chronic or acute, interfere with students' ability to participate in and enjoy school. If student are to develop the cognitive skills of literacy, numeracy, digital literacy and data literacy through sustained learning in schools, they need first to be in good overall health.

The Education 2030 Learning Framework is not just about cognitive development. E2030 Learning Framework encompasses the holistic foundations for children and young people to live and thrive at school, in 2030 and beyond. This holistic approach means taking into account not just the cognitive skills that they will need, but the broader conditions that will enable them to develop these skills. Therefore, health is considered a core condition, alongside literacy, numeracy, digital literacy, and data literacy, for Education 2030.

The World Health Organization (WHO) defines health as 'a state of complete physical, mental and social well-being, and not merely the absence of disease or infirmity' (WHO, 2006[7]) . Based on this definition, the WHO defines *health literacy* as the ability of individuals to gain access to, understand and use information in ways which promote and maintain good health (i.e. to make sense of communication in the area of personal health, also as brought to you by public and commercial healthcare).

However it is important to note that health and health literacy are not the same: the latter is a subset of the former. That is to say, is not enough to have health-literate students, i.e. students who have the knowledge, skills, attitudes and values to lead physically active and healthy lives. We need to ensure all students can actually embody and embrace meaningful and sustainable healthy behaviours. That is why 'health' (rather than health literacy) is included in the Education 2030 Learning Framework.

(Kickbusch and Maag, 2008[8]) understand health literacy as the capacity to make sound health decisions in the context of everyday life. As result of their review of previous definitions and models, (Sørensen et al., 2012[9]) define health literacy as a wide range of skills and competences that people develop to seek out, comprehend, evaluate and use health information and concepts to make informed choices, reduce health risks and increase their quality of life (Zarcadoolas, Pleasant and Greer, 2005[10]).

Health literacy concerns the knowledge and competences of persons to meet the complex demands of health in modern society. It basically entails people's capacities, skills,

knowledge, motivation and confidence to access, understand, appraise and apply health information to form valid judgments and make responsible decisions in everyday life in terms of healthcare, disease prevention and health promotion to improve quality of life.

To translate health literacy into actual physical health, we will need to support children and young people to embody and embrace healthy habits so they can enjoy *actual and ongoing* physical health now and in the future.

Note to the reader – this section will be revisited, refined and elaborated.

Social, emotional, moral and ethical foundations also need to be acknowledged as basic

The Education 2030 Learning Framework aspires to encompass a holistic approach to developing the whole child and thus articulates the social, emotional and moral or ethical dimension as part of the fundamental foundations important for all students to live as engaged, responsible and conscientious citizens.

This holistic approach to education—one that values not only cognitive development, but also physical health and the socio-emotional and ethical dimensions of our development—are not unique to the Education 2030 Learning Framework (see the draft concept note "a competency for 2030").

Social and emotional foundations will help students to lay a solid grounding to build their success in academic, economic and social life.

Note to the reader. This section will be elaborated.

Moral and ethical foundations (to be completed)

Note to the reader. This section will be elaborated

Without a solid grounding in these core skills and foundations, disadvantaged children are at risk of being even further disadvantaged

Note to the reader. This section will be elaborated

2. Complex/ Compound Competencies

Definitions and scope

The OECD 2030 Learning Framework defines "complex competencies/ compound competencies" as "newer competencies that have emerged to meet the demands from today's society as well as challenges and opportunities of the future".

Note to the reader – the definitions will be refined.

Box 2.1. Key messages on complex/ compound competencies

- New demands have been calling for schools to prepare students with a broader and more complex set of competencies
- These newer competencies range from global competency, financial literacy, media literacy, entrepreneurship, computational thinking, and literacy for sustainable development.
- While these competencies are valuable additions to a future-oriented curriculum, they can be embedded the existing curriculum without leading to a curriculum that is 'a mile wide and an inch deep.'

New demands have been calling for schools to prepare students with a broader and more complex set of competencies

Digital and data transformations are not the only generation-defining changes to direct recent history. In light of recent global events and mega-trends, schools are under mounting pressure to modernise curricula so that students can develop a broader set of knowledge, skills, values and attitudes to help them cope with and overcome the personal, professional and social realities they will face today and after school.

For instance, following the devastation of the Global Financial Crisis in 2008, some sectors of society called for schools to develop students' financial literacy. In the wake of 'fake news,' and with digital technologies transforming traditional news media, there are increasing demands for schools to develop students' media literacy, i.e. the ability to derive meaning from and assess the credibility of multiple media sources through for instance critical thinking. With the explosion of 'start-up' culture, and the corresponding disruption to traditional workforce models and professional pathways, there are growing calls for students to develop their entrepreneurial skills. And in a world increasingly scarred by terror attacks and threats to daily civilian life and peace, the need for global competencies—such as empathy, tolerance, and respect for others—is paramount.

Note to the reader – this section will be refined.

These newer competencies range from global competency, financial literacy, media literacy, entrepreneurship, computational thinking, and literacy for sustainable development.

Over the course of time and to adjust to changes in society, new concepts emerge that are considered to be of key importance for students to learn in schools. Currently some of these emergent concepts are global competence/ global citizenship, entrepreneurship, financial literacy, media literacy and so forth. However, integrating these new concepts into the teaching and learning can be challenging due to their multi-dimensional nature and complexity.

Education systems are primarily organised around subject disciplines and it is not always clear cut through which discipline/subject such a concept should be taught or, if an inter-disciplinary approach is chosen, which aspects of the concept should taught through which subjects (i.e. how to ensure an integrated curriculum). This oftentimes poses challenges, for example, to curriculum designers on how to integrate such concepts into the curriculum and /or guidelines, i.e. as a new subject (leading to curriculum overload) or how to embed them within subjects (i.e. conceptual complexity). Similarly, teachers are challenged to embed these new concepts in their teaching and are oftentimes lacking adequate support to develop a deeper understanding of the concepts and how they can most effectively embed them into their teaching.

The OECD 2030 Learning Framework outlines the relevant knowledge, skills, attitudes and values that young people need to acquire in order to understand, engage with and shape a fast-changing world.

The Framework is also intended to serve as an overarching taxonomy that can be used to deconstruct new demands/ concepts that emerge over time on teaching and learning, such as financial literacy, global competence, student well-being, etc. to make it easier, for example, for curriculum designers to provide clear guidance to practitioners or for teachers to gain a deep understanding of the concepts and to be able to foster, at least aspects of them, effectively through the subject-discipline they are teaching.

Some of the key newer demands are outlined here, though this is by no means comprehensive and is included to illustrate the ever expanding scope of skills and knowledge that schools and school systems will have to continuously adapt and respond to.

Note to the reader – the following sections will be refined and elaborated after the IWG meeting.

Global competency, global citizenship

Developing global citizenship competency is relevant to our world that is increasingly interdependent and characterized by VUCA – volatility, uncertainty, complexity, and ambiguity (Reimers and Chung, 2016[11]). The UN's Global Education First Initiative (UNESCO, 2012[12]) notes that "it is not enough for education to produce individuals who can read, write and count. Education must fully assume its central role in helping people to forge more just, peaceful, tolerant and inclusive societies".

In PISA, global competence is 'the capacity to examine local, global and intercultural issues, to understand and appreciate the perspectives and world views of others, to engage in open, appropriate and effective interactions with people from different cultures, and to act for collective well-being and sustainable development '. However, PISA is an

assessment tool, and so necessarily has a narrow definition for assessment purposes. The Education 2030 Learning Framework is an aspirational framework: it tries to encompass a broader understanding than is possible for assessment purposes.

Global citizenship or global competency education provides the knowledge, skills, attitudes, and values students need to cooperate in resolving the interconnected challenges of the 21st century, including not only preparing students to be successful in the 21st century workplace, but also address climate change, conflict, poverty, hunger, and issues of equity and sustainability (Menton, 2015). For example, NASA (2016) documents that while global sea levels rose about 17 cm (6.7 inches) in the last century, the last decade saw a rate of increase that was nearly double that of the last century; the amount of carbon dioxide absorbed by the upper layer of oceans is increasing by about 2 billion tons a year. According to UNESCO, we need to provide the kind of education that teaches people how to live together, instilling core skills, values, and attitudes that encourage respect for human rights, social justice, diversity, gender equality, and environmental sustainability (UNESCO Infographic, 2016).

Global citizenship education aims to empower learners to assume active roles to face and resolve global challenges and to become proactive contributors to a more peaceful, tolerant, inclusive and secure world (2030,(n.d.)[13]) http://en.unesco.org/gced).

Intercultural competence describes a combination of attitudes, knowledge and skills applied through action which enables one to:

- understand and respect people who are perceived to have different cultural affiliations from oneself
- respond appropriately, effectively and respectfully when interacting and communicating with such people
- establish positive and constructive relationships with such people

'Respect' means that one has a positive regard for, appreciates and values the other; 'appropriate' means that all participants in the situation are equally satisfied that the interaction occurs within expected cultural norms; and 'effective' means that all involved are able to achieve their objectives in the interaction at least in part (E2030 glossary; (Europe, 2016[14]).

Literacy for sustainable development

Environmental literacy describes the capacity of an individual to act successfully in daily life on a broad understanding of how people and societies relate to each other and to natural systems, and how they might do so sustainably. This requires sufficient awareness, knowledge, skills, and attitudes in order to incorporate appropriate environmental considerations into daily decisions about consumption, lifestyle, career, and civics, and to engage in individual and collective action (Oganisjana and Matlay, 2012[15]).

Entrepreneurship and innovation

As new sources of growth are urgently sought – which involves the creation and diffusion of new products, processes and methods – entrepreneurship and innovation appear to be a critical part of the solution (Bloom, 2012; Andrews, 2015). The extraordinary stories of innovation staged the likes of Steve Jobs, Elon Musk or Bill Gates have captured the world's imagination, and triggered many governmental and social initiatives aiming at

fostering innovation, entrepreneurship and business incubation, including those promoted by the OECD (Borins, 2001).

Innovation and entrepreneurship are, like other newer competencies, resistant to strong or simple definitions.

Entrepreneurship can be understood as a dynamic array of personality traits, motivation, cognition, needs, emotions, abilities, learning, skills and behaviour, on the basis of which an individual or a group of individuals interact with the environment in order to identify, generate and convert opportunities into new values (Oganisjana and Matlay, 2012[15])

Innovation is similarly a very broad, complex and relatively new concept and almost all the attempts to define it point to a process that starts with an idea or discovery, and gets implemented through the vision, grit or drive of a single individual that builds throughout collaboration and ends having an effect perceived all over the world and a substantial impact through parts of it.

Innovation may be understood as the creation of new value, new demands, new jobs, new products, new services, new tools, new processes, new ways of thinking, new ways of living, etc (OECD,(n.d.)[16]).

Computational thinking (programming and coding)

Coding and programming in schools is not new. As early as the 1980s, coding and programming was taught in U.S. schools mainly focusing on learning programming languages, but also for using computers for learning activities across the curriculum or designing software (Pea and Kurland, 1984[17]).

During the last 5 years, however, there has been renewed interest in these concepts, with an additional emerging focus on computational thinking. There are two important drivers, societal and economic, for the development of programming, coding or computational thinking skills amongst young people. The main rationale for the (re) introduction of these competencies in schools is mainly to foster 21st century competencies to participate fully in the society and the labour market.

Coding, programming and the wider concept of computational thinking reflects the need to understand the world around us by using computational methods to develop problem solving strategies (Balanskat and Engelhardt, 2015[18]).

Teaching coding and programming in schools is also seen as a way to raise students' interest in computer science and other STEM subjects and learning area.

Financial literacy

In recent years, many countries and economies have become increasingly concerned about the level of financial literacy of their citizens of all ages. This has stemmed from shrinking public and private support systems, shifting demographic profiles including the ageing of the population, and wide-ranging developments in the financial marketplace. As a result, financial literacy is now globally acknowledged as an important element of economic and financial stability and development.

Policy makers have increasingly recognised the importance of developing financial literacy skills among young people, both for current and future young generations. Young people face immediate financial decisions; often, they are already consumers of financial services, such as bank accounts with access to online payment facilities. As they approach

the end of compulsory education, young people in school also have to decide, with their parents, whether to continue with post-compulsory education and how to finance such education.

Financial literacy can be understood as the ability to process economic information and make an informed decision about financial planning, wealth accumulation, debt, and pensions Lusardi (2015).

Financial education may also be understood as 'the process by which financial consumers/investors improve their understanding of financial products, concepts and risks and, through information, instruction and/or objective advice, develop the skills and confidence to become more aware of financial risks and opportunities, to make informed choices, to know where to go for help, and to take other effective actions to improve their financial well-being' (OECD, 2005).

Recent trends are likely to make the need for financial literacy skills even more important in the future. First, future generations are likely to face more challenging financial choices, given the growing complexity in the financial products, services and systems available. Financial education will therefore have a role in equipping people with the financial literacy to understand complex products and services, choose the best ones for them, and protect themselves from financial mis-selling and abuse, in conjunction with financial consumer protection and regulation policies. The spread of digital financial services may open up new opportunities for poor and financially excluded people to access the formal financial system, but can also expose consumers to new security threats and fraud risks that are compounded when low financial literacy is combined with a lack of digital skills (OECD, 2016[19]).

Second, future generations will probably bear more financial risks during their lives than the current generation, due to increased life expectancy, a decrease in welfare and occupational benefits, more 'individualised' pensions, and uncertain economic and job prospects. Third, growing income and wealth inequality will put socio-economically disadvantaged groups at further disadvantage, meaning that they will need financial literacy more than ever to be able to make informed financial decisions. Providing youth with financial education may help bridge financial literacy disparities due to differences in students' socio-economic status. Finally, the financial crisis and recent cases of financial scams, banking fraud and tax avoidance spurred a growing demand for ethics in financial transactions at large (OECD, 2015b; Wehinger, 2013).

Well-being

Should we teach well-being? Can well-being be taught at a large scale, and should it be taught in schools? Does teaching well-being improve academic performance and other life outcomes? What knowledge, skills, attitudes, and values increase youth well-being?

Embedded in the concept of education is the notion of changing individuals in a particular direction, of taking them from their current state to, ideally, a better one. That direction is informed by how we measure success in an educational setting. If schools measure only academic performance, as they traditionally have, then effective schools will, at best, produce students who learn how to excel academically and perform well on standardized exams. However, if schools choose to measure multifaceted well-being as well, and hence also teach the knowledge, skills, attitudes, and values (KSAV) for well-being, they can also enable their students to lead flourishing lives.

Schools do not currently teach the KSAV for more positive emotions, better relationships, more engagement, and more purpose and meaning in life. Individual well-being is widely considered to be a private matter, especially if teaching for it consumes scarce educational resources and undermines academic learning.

It is fair to argue that opportunities for the health, safety, educational progress, and the moral development of youth are almost universally desired (Cohen, 2006) (Martens and Witt, 2004[20]) (Land, Lamb and Mustillo, 2001[21]). Peterson (2006) contended that schools are uniquely conducive to these opportunities; he called for schools to expand their focus beyond academic learning to also include the promotion of character and well-being.

While these competencies are valuable additions to a future-oriented curriculum, they can be embedded the existing curriculum without leading to a curriculum that is 'a mile wide and an inch deep.'

Schools need to do more than focus narrowly on student achievement within a limited scope of learning or performance on standardised assessments, if students are to be equipped to grapple with and overcome these challenges. However while including such competencies in the curricula is critical to preparing students, in practice the challenge of how to incorporate such competencies within curriculum presents a profound challenge to policy makers, school leaders, teachers and curriculum experts.

It may seem a tempting option to simply add these new areas as stand-along subjects or learning areas. After all, if financial literacy and media literacy are so important for children and young people to thrive in today's world, they need to be given due attention in the curriculum.

But the risk of this approach is that reforms will lead to ever-expanding curricula that are 'a mile wide, and an inch deep.' The issue of curriculum overload is a serious issue when considering how to engage in demands for curriculum reform in the direction of 2030.

Curriculum content overload is the expansion and curriculum overcrowding caused by new growing demands and expectations of parents, universities and employers towards the content of school education which is regarded as problematic because it typically results in teachers and students giving superficial coverage of broad subjects resulting in "more learning" rather than "deep learning" (2030,(n.d.)[13]).

Countries and jurisdictions cannot continuously add new learning areas, or revise the whole curriculum at the pace required to keep step with demands for new competencies.

Adding newer competencies into the curriculum through introducing new learning areas would place considerable pressure on the teachers and school leaders expected to adapt to and implement the new content in the classroom. It would similarly present challenges to the initial teacher education providers, assessment authorities and other stakeholders with a vested interest in ensuring a highly skilled workforce and coherent teaching and learning eco-system.

From the perspective of student learning, introducing new learning areas also presents a challenge. We need to develop ways to embed these newer competencies within the curriculum in a meaningful way that will a) lead to deep learning experiences for all students; and b) not displace quality learning in the developmental foundations or core skills and conditions of literacy, numeracy, digital and data literacy, health and socio-emotional and moral/ ethical foundations.

Like cross-cutting themes, newer competencies can be covered across subjects and learning areas, rather than being taught and learned in one particular subject. They can connect programme content across disciplinary boundaries; enrich the curriculum without overloading it through the introduction of additional teaching subjects; and facilitate interdisciplinary thinking and collaborative learning (glossary).

By breaking down the newer competencies into constituent knowledge, skills, values, and attitudes, countries and jurisdictions can embed newer competencies within the curriculum without introducing new subjects or learning areas within the realm of the existing curriculum.

Note to the reader - The examples of how to break down these competencies into existing curriculum – using the taxonomies of knowledge, skills, attitudes and values will be provided through:

- examples given in [EDU/EDPC(2016)RD38] and with additional examples to be collected
- results of the curriculum content mapping of the E2030 project

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